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Wiesner

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(54) **PRODUCT DISPENSER WITH CRANKABLE ASSEMBLY**

(75) Inventor: **Douglas A. Wiesner**, Cincinnati, OH (US)

(73) Assignee: **Turnout Products, Inc.**, Cincinnati, OH (US)

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G01F 11/00 (2006.01)
B65D 35/28 (2006.01)

(52) **U.S. Cl.** **222/1**; 222/95; 222/105; 222/326

(58) **Field of Classification Search** 222/95, 222/101, 102, 103, 390, 92, 96, 97, 98, 99, 222/100, 106, 107, 326; 401/169
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,568,921	A *	1/1926	Roberts et al.	222/93
1,930,037	A *	10/1933	Brubaker	141/164
2,064,357	A	12/1936	Ritterbusch	
2,140,007	A	12/1938	Grandman	
2,545,751	A *	3/1951	Ruch	222/103
3,232,488	A	2/1966	Headberg	
3,860,147	A	1/1975	Vessio et al.	
3,954,205	A	5/1976	Williams	
4,010,873	A	3/1977	Mardirossian	
4,019,655	A	4/1977	Moeller	
4,046,288	A	9/1977	Bergman	
4,125,206	A	11/1978	Wilson	
4,160,513	A	7/1979	Cockerham	
4,223,809	A	9/1980	Martin	
4,234,104	A	11/1980	Apuzzo, Jr. et al.	
4,258,864	A	3/1981	Karamanolis et al.	
4,301,945	A	11/1981	Dworkin	
4,303,110	A	12/1981	Chen	
4,331,265	A	5/1982	Warlick	
4,403,714	A	9/1983	Kane	
4,424,916	A	1/1984	Pearson	
4,437,584	A	3/1984	Connors et al.	
4,450,982	A	5/1984	Ferreira	
4,508,239	A	4/1985	Rozzen	
4,508,242	A	4/1985	Wolfe	
4,570,829	A	2/1986	Allen	
4,585,147	A	4/1986	Wodnicki	
4,600,126	A	7/1986	Arango	
4,629,095	A	12/1986	Smith	

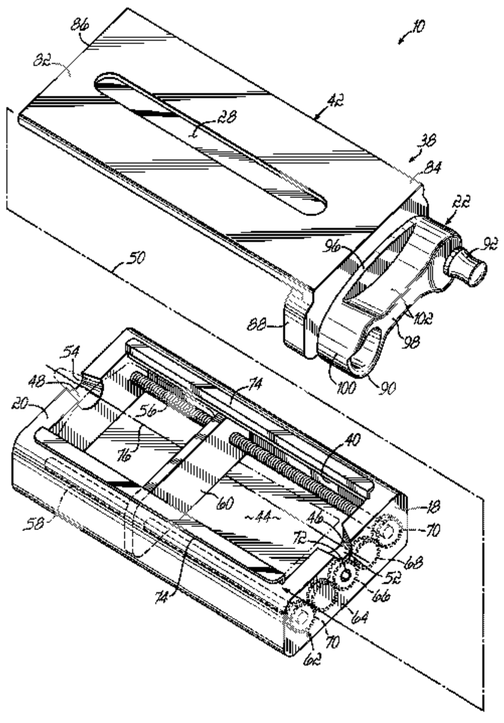
(Continued)

Primary Examiner—Kevin P Shaver
Assistant Examiner—Daniel R Shearer
(74) *Attorney, Agent, or Firm*—Wood, Herron & Evans, LLP

(57) **ABSTRACT**

A product dispenser for compelling a flowable product from a container comprising a frame assembly having first and second opposed frame assembly ends, first and second opposed dispensing notches respectively on the first and second frame assembly ends, at least one elongate drive member substantially extending between the first and second assembly ends and having first and second drive member ends. The dispenser may also have first and second drive trains each comprising a plurality of interconnected gears and each respectively operatively coupled to the first and second drive member ends, a driven member threadably coupled to the elongate drive member and adapted to travel between the first and second frame assembly ends, and a crank assembly adapted to be selectively operatively coupled to one of the drive trains. Actuation of the crank assembly may cause travel of the driven member between the first and second frame assembly ends.

10 Claims, 5 Drawing Sheets



U.S. PATENT DOCUMENTS

4,688,700	A	8/1987	Guthrie
4,793,526	A	12/1988	Webb
5,048,725	A	9/1991	Peterson
5,050,773	A	9/1991	Choi
5,167,348	A	12/1992	Okami et al.
5,203,473	A	4/1993	Willey
5,230,444	A	7/1993	Dunbar
5,271,529	A	12/1993	Stuber
5,305,922	A	4/1994	Varon
5,322,194	A	6/1994	Roberts
5,323,931	A	6/1994	Robards, Jr. et al.
5,323,932	A	6/1994	Bauman
5,393,153	A	2/1995	Bouthillier et al.
5,397,030	A	3/1995	Williams
5,447,255	A	9/1995	Smedley
5,577,640	A	11/1996	Albini et al.
5,810,205	A	9/1998	Kohen
5,813,572	A	9/1998	Kolacek
5,845,813	A	12/1998	Werner
5,868,282	A	2/1999	Imhoff
5,875,929	A	3/1999	Nguyen
5,884,812	A	3/1999	Stawowski
5,887,754	A	3/1999	Wilkinson
5,888,010	A	3/1999	Laux
5,897,029	A	4/1999	Tong
5,897,030	A	4/1999	Stangle
5,920,967	A	7/1999	Souza
5,957,334	A	9/1999	Rosario
5,975,362	A	11/1999	West
6,318,596	B1	11/2001	Wiesner

* cited by examiner

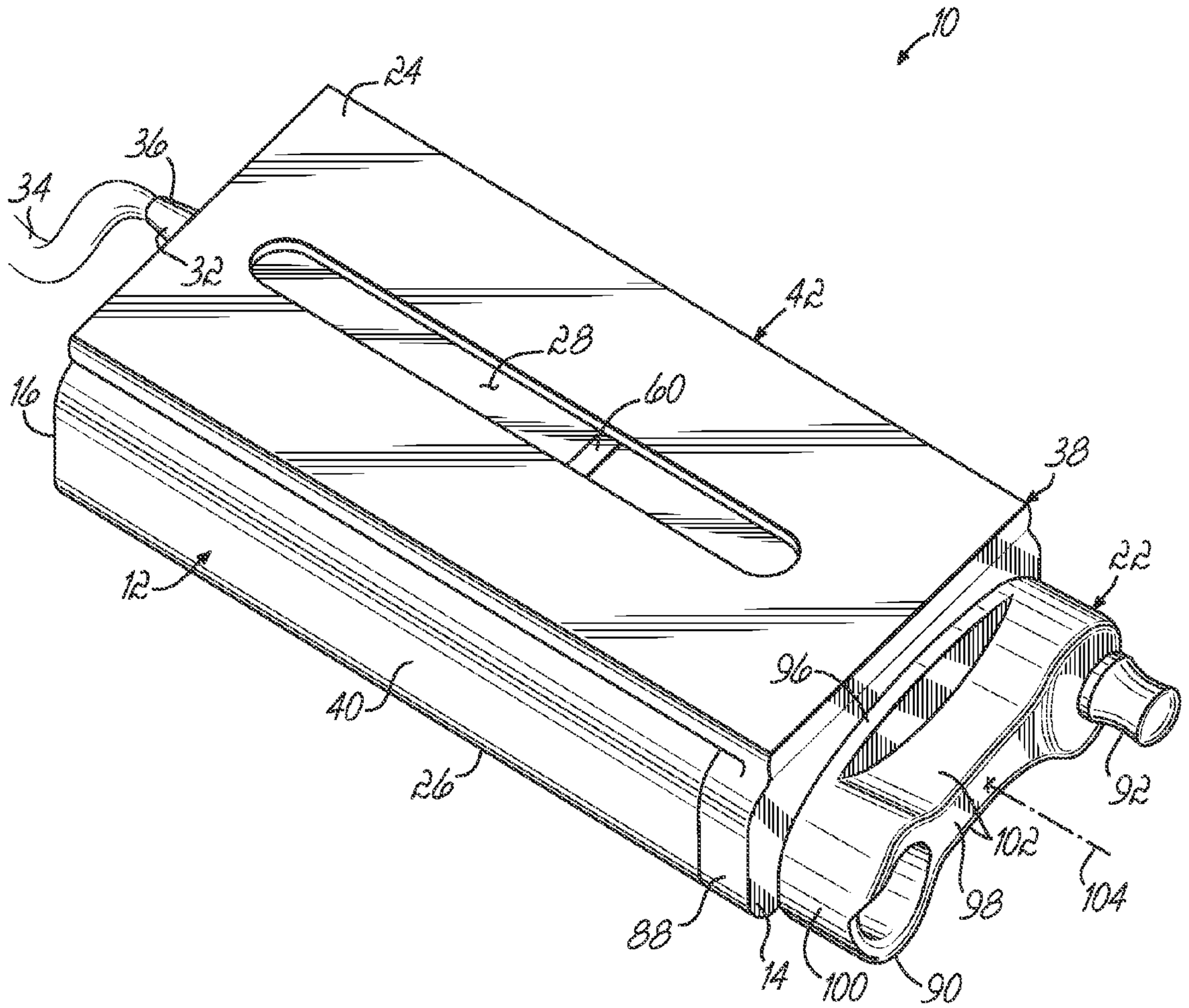


FIG. 1

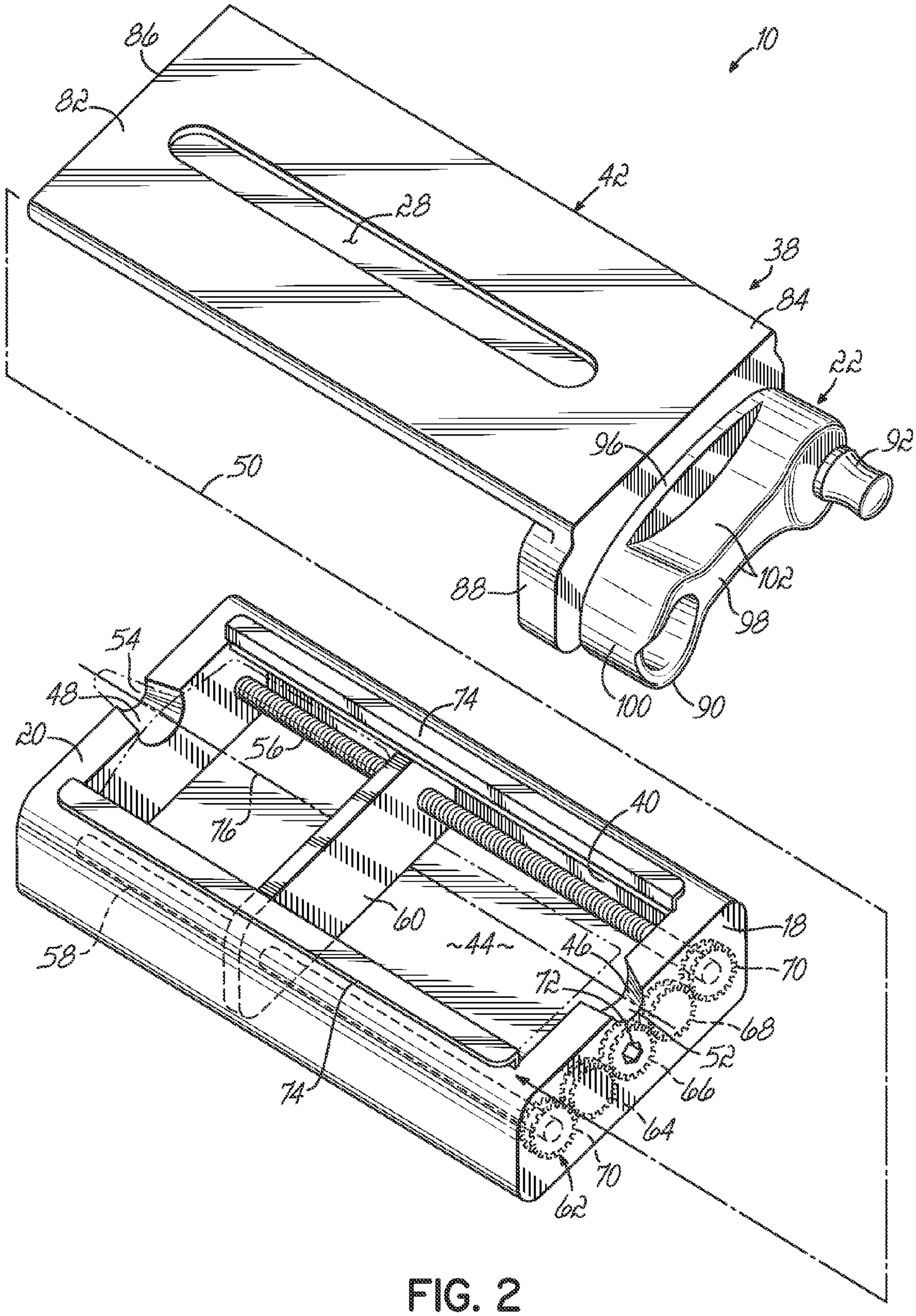

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FIG. 2

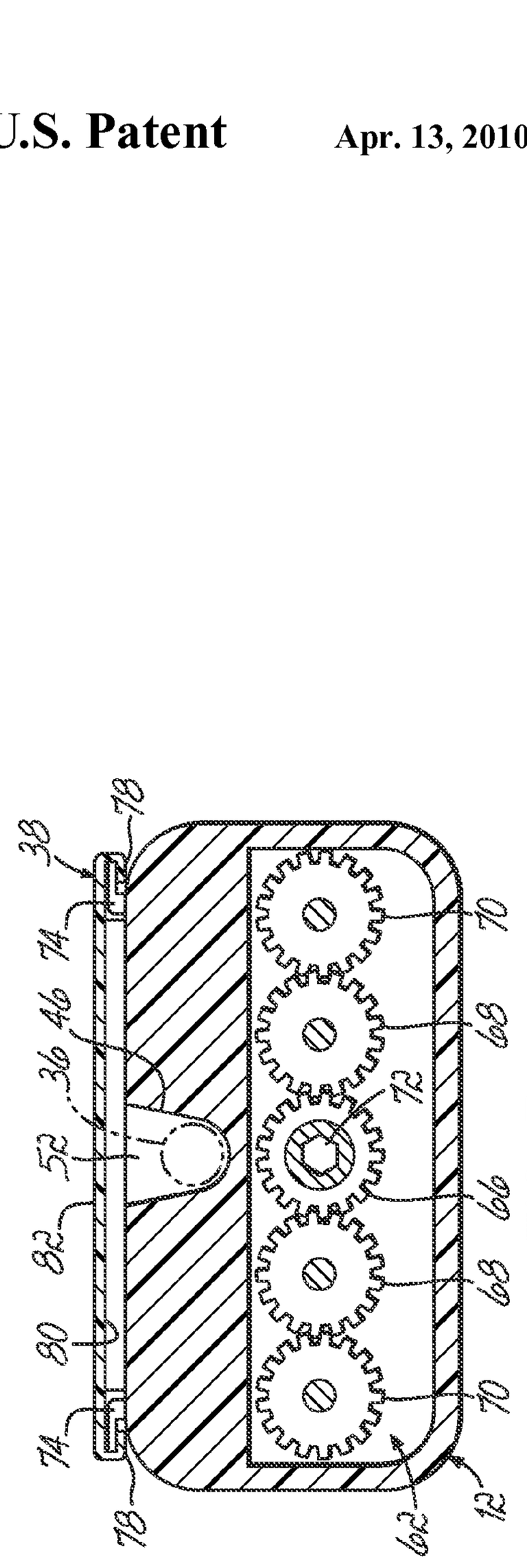
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FIG. 3

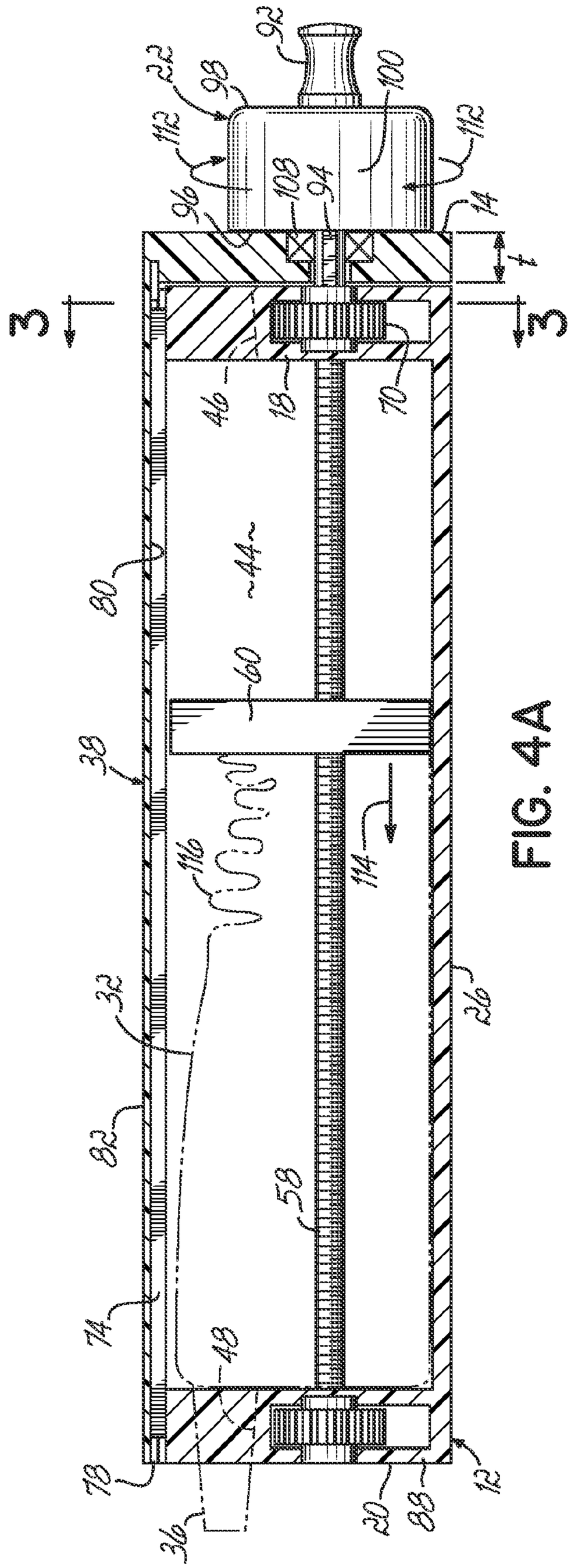
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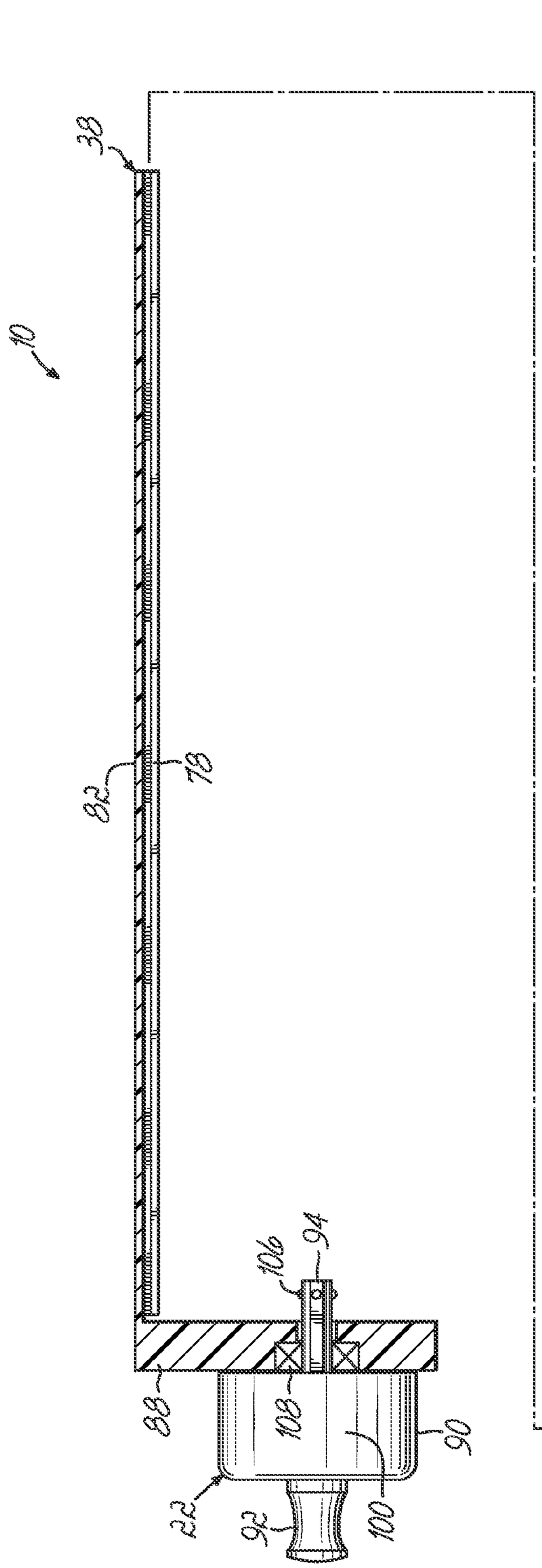
FIG. 4A



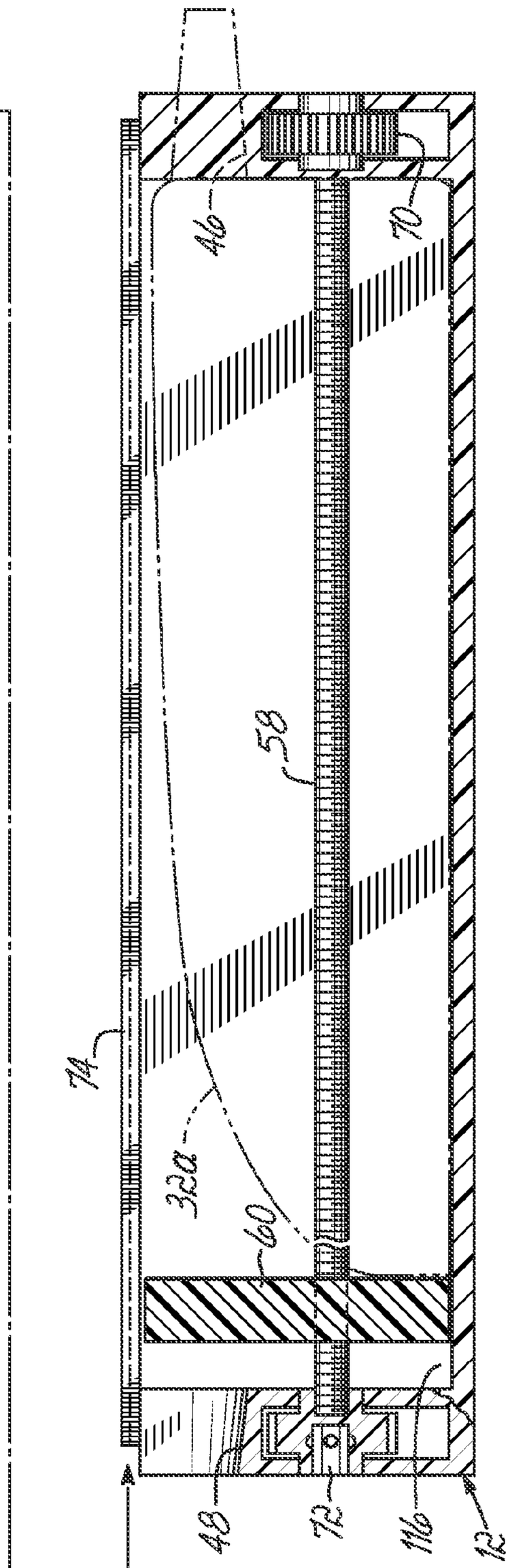


FIG. 4B

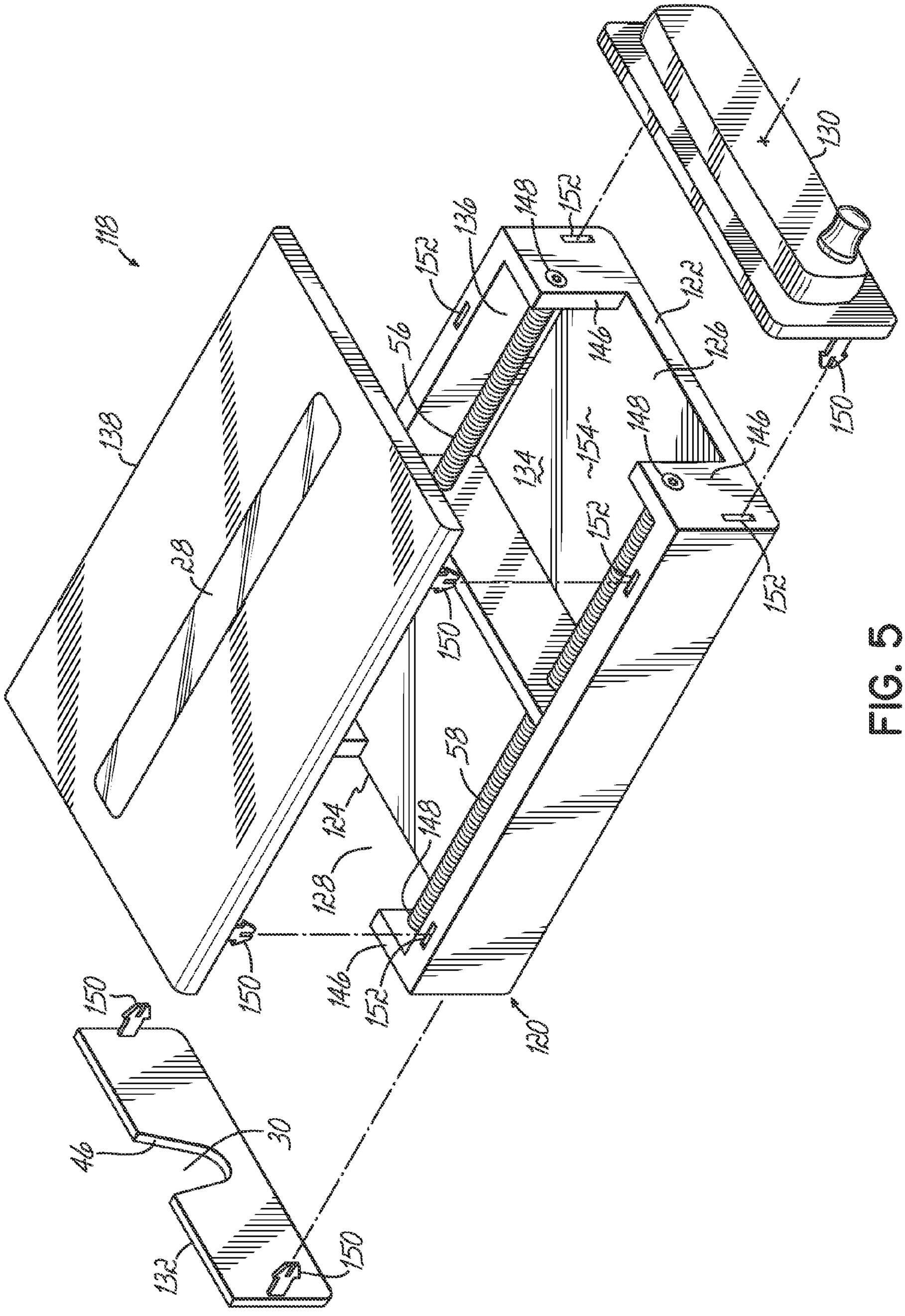

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FIG. 5

PRODUCT DISPENSER WITH CRANKABLE ASSEMBLY

FIELD OF THE INVENTION

The invention relates to product dispensers. More specifically, the invention relates to an improved product dispenser for compelling a product from a dispenser.

BACKGROUND OF THE INVENTION

Product dispensers for compelling a flowable product from a deformable container are known in the art. Some of them are described in U.S. Pat. No. 4,125,206 issued to Wilson on a toothpaste dispenser; U.S. Pat. No. 4,508,242 issued to Wolfe on a toothpaste extractor and U.S. Pat. No. 6,318,596 issued to Wiesner on a product dispenser.

Certain prior art product dispensers may include a screw or worm gear retained within a frame having a squeezing member received upon the screw to travel from a first end of the screw to a second end of the screw to compel a flowable product from a container. Once the squeezing member has reached the end of its travel at the second end of the screw, a user must actuate the squeezing member and, therefore, the screw in a reverse direction so that the squeezing member travels along the screw back towards the first end.

Some of these prior art product dispensers require the squeezing member to travel along the length of the screw first to dispense product from a container and then reverse its direction along the screw without any work performed other than to return the squeezing member back to its origin. This requires unproductive time on the part of the user to reconfigure the dispenser for subsequent use. Further, this type of mechanism is inefficient and causes undue fatigue upon a user's fingers with manually actuated product dispensers and undue stress upon mechanical and electrical parts in an automatically actuated product dispenser, leading to accelerated mechanical and/or electrical failure of prior art product dispensers. In addition, these prior art product dispensers are generally complex in order to accommodate both forward and reverse travel of the squeezing member retained within the frame. These product dispensers have many moving parts and are not economical to manufacture or repair.

Other prior art products that include a squeezing member mounted on a screw may not require reversal in the direction of travel of the squeezing member to return it to its origin. These products, however, may include an actuating member in the form of a rotatable knob that controls travel of the squeezing member. A problem with this type of configuration, however, may lie in the relatively large magnitude of the force required to rotate the knob and cause travel of the squeezing member against the surface of the container holding the flowable product being dispensed. This problem is accentuated when the user of the product is a small child or a person with limited hand strength.

A product dispenser that does not require reversal of travel of a squeezing member while requiring a relatively low magnitude of force to be applied to an actuating member controlling travel of the squeezing member is therefore desirable.

SUMMARY OF THE INVENTION

In accordance with an embodiment of the invention, a product dispenser for compelling a flowable product from a container includes a frame assembly having first and second opposed frame assembly ends, first and second opposed dispensing notches respectively on the first and second frame assembly ends, and at least one elongate drive member having first and second drive member ends and substantially extending between the first and second assembly ends. The dispenser includes first and second drive trains each having a plurality of interconnected gears and each being respectively operatively coupled to the first and second drive member ends, a driven member threadably coupled to the elongate drive member and adapted to travel between the first and second frame assembly ends, and a crank assembly adapted to be selectively operatively coupled to one of the drive trains. The dispenser may be such that actuation of the crank assembly causes travel of the driven member between the first and second frame assembly ends and such that actuation of the crank assembly causes the product to be expelled from the product container when the product container is positioned in the frame assembly and in communication with one of the dispensing notches.

In another embodiment, a product dispenser for compelling a flowable product from a deformable container includes a frame assembly having first and second opposed frame assembly ends, at least one elongate drive member having first and second drive member ends and substantially extending between the first and second opposed frame assembly ends, and a driven member threadably coupled to the at least one drive member and adapted to travel between the first and second frame assembly ends. The dispenser may further include a dispensing plate having a dispensing notch and adapted to be selectively coupled to one of the frame assembly ends, and a crankable drive train assembly adapted to be selectively operatively coupled to one of the drive member ends. The dispenser may be such that actuation of the crankable drive train assembly causes travel of the driven member between the first and second frame assembly ends, and such that actuation of the crankable drive train assembly causes the product to be expelled from the product container when the product container is positioned in the frame assembly and in communication with one of the dispensing notches.

In another aspect of the invention, a method for compelling a flowable product from a deformable product container may include the steps of inserting the product container into a frame assembly having first and second opposed frame assembly ends, first and second opposed dispensing notches respectively on the first and second frame assembly ends, at least one elongate drive member having first and second drive member ends and substantially extending between the first and second frame assembly ends, and first and second drive trains respectively operatively coupled to the first and second drive member ends.

The method may include the steps of positioning the product container within the frame assembly to expel the product through the first dispensing notch, releasably operatively coupling a crank assembly to the second drive member end, actuating the crank assembly to cause travel in a first direction from the second frame assembly end to the first frame assembly end of a driven member threadably engaged to the at least one drive member, applying pressure on the container with the driven member to thereby compel the product from the container and through the first dispensing notch, and uncoupling the crank assembly from the second drive member end.

The method may further include the steps of removing the container from the frame assembly, inserting a second product container into the frame assembly to expel the product through the second dispensing notch, releasably operatively coupling the crank assembly to the first drive member end, and actuating the crank assembly to cause travel of the driven member in a second direction from the first frame assembly end to the second frame assembly end.

Advantageously, a product dispenser in accordance with the principles of the invention does not require reversal of travel of the driven member before insertion of a second product container and, in light of the crank assembly, requires a relatively low magnitude of force to be applied to drive the driven member and thereby expel product from the product container.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objectives and advantages will become readily apparent to those of ordinary skill in the art from the following description of embodiments of the invention and from the drawings in which:

FIG. **1** is a perspective view of a product dispenser showing flow of a product from the dispenser.

FIG. **2** is a perspective assembly view of the dispenser of FIG. **1**.

FIG. **4**A is an elevational cross-sectional view of the dispenser of FIGS. **1-2**.

FIG. **4**B is an elevational cross-sectional assembly view of the dispenser of FIGS. **1-4**.

FIG. **3** is an end cross-sectional view taken along line **4-4**.

FIG. **5** is a perspective assembly view of an alternative embodiment of a product dispenser.

DETAILED DESCRIPTION

With respect to the figures, and more particularly to FIG. **1**, a product dispenser **10** in accordance with the principles of the invention includes a frame assembly **12** having opposed first and second ends **14**, **16** in the form of walls **18**, **20** (FIG. **2**), a crank assembly **22** coupled to the first end **14** of the frame assembly **12**, top and bottom walls **24**, **26**, a window **28** on the top wall **24**, and an opening (not shown) through the wall **20** at the second frame assembly end **16** such that a product container **32** containing a product **34** is in fluid communication with the outside of the dispenser **10**. FIG. **1** depicts an exemplary nozzle **36** of a product container **32** extending through the opening **30** such that the product **34** is expelled from the product dispenser **10** as shown. Nevertheless, a supply of the product **34** may be positioned in the dispenser **10** with or without the container **32**.

With reference to FIG. **2**, the product dispenser **10** includes a frame assembly **12** and a cover assembly **38** held together, for example, frictionally, magnetically or mechanically. The frame assembly **12** includes two lateral walls **40**, a bottom wall **26** and an oppositely located opening **44** adapted to receive the cover assembly **38**. The frame assembly **12** has two oppositely located first and second dispensing notches **46**, **48** respectively on the first and second end walls **18**, **20**. When the frame assembly **12** and cover assembly **38** are joined together following a direction indicated by the arrow **50**, the first and second notches **46**, **48** respectively define first and second product dispensing openings **52**, **54** (FIG. **4**A) fluidly communicating the interior and exterior of the product dispenser **10**. The dispensing notches **46**, **48** include any suitable shape and dimensions to accommodate particular types of product containers. A notch **46**, **48** may, for example, be frustoconically shaped such that it may receive a matching frustoconical shape of a nozzle **36** of a product container **32** such as nozzles commonly found in certain toothpaste tubes.

One or more elongated drive members **56**, **58** extend substantially between the first and second frame assembly end walls **18**, **20** and are positioned so as not to substantially obstruct the product container **32**. In the exemplary embodiment of FIG. **2**, two drive members **56**, **58** are spaced and respectively located proximate the lateral walls **40** of the frame assembly **12**. The drive members **56**, **58** are externally threaded, as shown, and are made of a suitable material to permit structural rigidity. The drive members **56**, **58** may, for example, be made of plastic, wood or metal. The drive members **56**, **58** in this exemplary embodiment are suitably joined to one or both of the frame assembly end walls **18**, **20** but may alternatively not be joined to the end walls **18**, **20** at all.

With continued reference to FIG. **2**, a driven member **60** in the form of a generally flat plate is threadably coupled to each of the drive members **56**, **58** such that rotational motion of a drive member **56**, **58** will cause travel of the driven member **60** in a direction between the first and second frame assembly ends **14**, **16**. The driven member **60** includes a flat prism shape, as depicted, but it may alternatively include any shape suitable to travel between the first and second frame assembly ends **14**, **16** and engage a product container **32** held by the dispenser **10**. The driven member **60** has suitable dimensions to allow engagement of the product container **32**. In the exemplary embodiment of FIG. **2**, the driven member **60** has a width substantially extending between the inner faces of the lateral walls **40** of the dispenser **10** and has a height substantially extending between the inner faces of the top and bottom walls **24**, **26**. The driven member **60** may be made of any suitable material such as plastic, wood or metal such that it maintains structural rigidity while engaging a product container **32** and such that it may be suitably threadably coupled with the drive members **56**, **58**.

With reference to FIGS. **2-3**, two drive trains **62** are formed into each the frame assembly end walls **18**, **20**. The drive train **62** includes any suitable method and components suitable to transfer rotational motion of one member or portion of the drive train **62** to one or more drive members **56**, **58**. The drive train **62** may, for example, include several serially connected gears. In the exemplary embodiment of FIG. **2**, a centrally located driving gear **66** is coupled to two oppositely located first driven gears, each of which is in turn coupled to one of a pair of second driven gears **70**. Each of the second driven gears **70** is operatively connected to an end of a drive member **56**, **58** such that rotation of a second driven gear **70** causes rotation of the drive member **56**, **58** connected thereto. Functionally, in this exemplary embodiment, rotation of the driving gear **66** in one direction causes rotation of each of the drive members **56**, **58** in the same direction as the rotational direction of the driving gear **66**. The driving gear **66** further includes a suitably shaped aperture **72** to allow engagement by a tool or crank mechanism.

Two tracking elements **74** made, for example, of metal or any other suitable material, extend substantially between the first and second end walls **18**, **20**, lie on a plane defined by the opening **44** of the product dispenser **10**, and are oppositely located from a longitudinal axis **76** of the product dispenser **10**. The shape, dimensions and material of the tracking elements **74** may be suitably chosen to permit engagement of the tracking elements **74** with a pair of channel members **78** (FIG. **3**) located on an interior face **80** of the cover assembly **38**. While the embodiment of FIGS. **2** and **3** depict a pair of complementary tracking elements **74** and channel members **78** to provide mechanical interlocking of the frame assembly **12** and the cover assembly **38**, persons of ordinary skill in the art will appreciate that, alternatively, other methods and components may be used to facilitate interlocking of the frame assembly **12** and cover assembly **38**. These may include, for example, magnetic components to permit magnetic locking or frictional elements such as textured surfaces or tightly fitting complementary elements.

With reference to FIG. **2**, a cover assembly **38** includes a generally flat, rectangular cover member **82** having first and second cover member ends **84**, **86**. The cover assembly **38** further includes a plate portion **88** extending perpendicularly from the first end **84** of the cover member **82**, and a crank assembly **22** adjacent the plate portion **88**. The cover member **82** is substantially dimensioned to cover the opening **44** in the frame assembly **12** and may be made of any suitable material to securely engage the frame assembly **12**, such as plastic, wood or metal. The cover member **82** includes a window **28** to permit viewing of a product container **32** within the product dispenser **10**. The window **28** includes suitable dimensions, shape and materials, such as translucent or transparent materials, to permit viewing of the product **34**. While the embodiment of FIG. **2** depicts a window **28** centrally located along the axis of the product dispenser **10**, the window **28** may alternatively be located anywhere on the body of the cover member **82**. Similarly, while the embodiment of FIG. **2** depicts a window **28** defining an area substantially smaller than the area defined by the cover member **82**, a person of ordinary skill in the art will appreciate that, alternatively, the window **28** may be substantially larger with respect to the cover member **82** or even be such that the entire cover member **82** is translucent or transparent, thereby permitting viewing anywhere through the body of the cover member **82**.

With reference to FIGS. **2** and **4**A, the crank assembly **22** is releasably or fixedly coupled to the plate portion **88** of the cover assembly **38**. The crank assembly **22** includes a main body portion **90**, a knob **92** and an engaging member **94**. The main body portion **90** of the crank assembly **22** includes suitable material, shapes and dimensions to permit manual rotation thereof. It may, for example, be made of plastic and have a shape generally as shown (FIG. **2**). In the exemplary embodiment of FIG. **2**, the main body portion **90** has opposed inner and outer faces **96**, **98**, a generally oval-shape outer surface **100** perpendicular to the inner and outer faces **96**, **98**, and depressions **102** in its center portion, such as to permit convenient grip by a human hand. A knob **92** is coupled to or may be alternatively integrally formed with the main body portion **90** of the crank assembly **38**, and extends outwardly from the plane of the outer face **98** of the main body portion **90**, to provide an alternative gripping surface to permit rotation of the crank assembly **38**. The inner face **96** of the main body portion **90** is generally adjacent the plate portion **88** of the crank assembly **38** while not affixed thereto, thereby permitting rotation of the main body portion **90** about an axis **104** (FIG. **1**) generally parallel to the longitudinal axis **76** of the product dispenser **10**.

With continued reference to FIGS. **2**, **4**A-**4**B, an engaging member **94**, including materials, shapes and dimensions suitable to engage the aperture **72** in the driving gears **66** of the frame assembly **12**, extends from the main body portion **90** of the crank assembly **38**, through the thickness "t" of the plate portion **88** and projects by a length suitable to engage the aperture **72** in the driving gears **66**. The engaging member **94** further includes a set of locking elements such as detent ball bearings **106** to prevent the main body portion **90** from separating from the plate portion **88** as well as to permit mechanical engagement with the driving gear aperture **72**. A bushing element **108** surrounds the engaging member **94** at least partially through the thickness of the main body portion **90**. The bushing element **108** permits smooth rotation of the main body portion **90** with respect to the plate portion **88**. Although a bushing element is **108** depicted, persons of ordinary skill in the art will appreciate that, alternatively, the engaging member **94** may be surrounded by any suitable components to facilitate rotation as described above or may be surrounded by no components at all.

The plate portion **88** is made of a suitable material and suitable thickness "t" to permit coupling with the frame assembly **12** and maintain the structural integrity of the product dispenser **10**. The plate portion **88** is coupled to the cover member **82** by any suitable components and methods such as mechanical fasteners, magnetic elements or adhesives or may alternatively be integrally formed therewith, as depicted in FIGS. **2**, **4**A-**4**B.

With reference to FIG. **4**B, the cover assembly **38** is slidably engaged with the frame assembly **12** in a direction as depicted by the arrow **110**, such that the tracking elements **74** of the frame assembly **12** engage the channel members **78** of the cover assembly **38**. The joining of the cover assembly **38** and the frame assembly **12** defines a cavity within which a product container **32** may be placed for dispensing of the product **34** therein.

With reference to FIGS. **4**A-**4**B, a product container is positioned within the frame assembly **12** in an orientation as depicted in FIG. **4**A, such that a portion of the container **32** from which the product **34** is to be expelled is at least partially placed within the first notch **46**. In the exemplary embodiment of FIG. **4**A, a nozzle **36** on the product container **32** is placed in the first notch **46**. The crank assembly **22** is actuated by rotating the main body portion **90** as indicated by the arrows **112** such that the drive member **56**, **58** is caused to rotate in the same direction. This rotation causes the driven member **60** to move in a direction as indicated by the arrow **114**, generally in a direction from the first frame assembly end **14** toward the second frame assembly end **16**. The longitudinal movement of the driven member **60** exerts pressure on the product container **32**, which is thereby deformed as illustrated by the puckered section **116** of the container **32** shown behind the driven member **60**.

The deformation of the product container **32** causes the product **34** to be compelled out of the product container **32** through the nozzle **36**, where it may be redirected or applied as desired. When the product **34** is compelled out of the container **32**, it may be applied directly onto a tool or surface (not shown).

With continued reference to FIGS. **4**A-**4**B, when it is desired to replace the container **32** because, for example, substantially all of the product **34** has been used, the cover assembly **38** is first uncoupled from the frame assembly **12** to expose and provide access to the container **32**. The driven member **60** will be generally proximate the second frame assembly end wall **20**. The container **32** is then removed from the product dispenser **10** and a second container **32***a* is placed within the frame assembly **12** such that the nozzle **36** or functionally equivalent portion of the container **32** is at least partially placed on the second notch **48**. The cover assembly **38** is advantageously turned around with respect to its original orientation, described above, and coupled to the frame assembly **12** such that the plate portion **88** is now adjacent the second frame assembly end wall **20**. Actuation of the crank assembly **22** via rotation of the main body portion **90** will thereby result in longitudinal motion of the driven member **60** in a direction from the second frame assembly end **16** toward the first frame assembly end **14**.

By permitting coupling of the cover assembly **38** with either frame assembly end wall **18**, **20**, the exemplary embodiment of FIGS. **1**-**4**B does not require reversal of travel of the driven member **60** before insertion of the second product container **32***a*. Further, because of the chosen shape and size of the main body portion **90** of the crank assembly **22**, the

product dispenser **10** requires a relatively low magnitude of force to cause product **34** to be expelled from the product container **32**, **32***a*.

With reference to FIG. **5**, in which like reference numerals refer to like features in FIGS. **1**-**4**B, an alternative embodiment of a product dispenser **118** includes a generally U-shaped frame assembly **120** having opposed first and second ends **122**, **124** in the form of openings **126**, **128**, a crankable drive train assembly **130** coupled to the first end **122** of the frame assembly **120**, a dispensing plate **132** coupled to the second frame assembly end **124**, a bottom wall **134**, and a top opening **136** adapted to receive a cover **138** that includes a window **28**.

The dispensing plate **132** includes a dispensing notch **46**, similar to the dispensing notch of FIG. **2**, a description of which may be referred to for an understanding of the notch **46** of FIG. **5** as well. When the frame assembly **120** and cover **138** are joined together following a direction indicated by the arrows **140**, the notch **46** defines a product-dispensing opening **30** fluidly communicating the interior and exterior of the product dispenser **118**. The crankable drive train assembly **130**, which is adapted to be selectively coupled to the first and second frame assembly ends **122**, **124**, includes a drive train wall **142** and a crank assembly portion **144**. The drive train wall **142** contains a drive train (not shown but similar to drive train **62** of FIG. **2**) and is similar to each of the walls **18**, **20** defining the frame assembly ends **14**, **16** of the frame assembly **12** of FIG. **2**. The drive train of the embodiment in FIG. **5** is similar to the drive train of FIG. **3**, the description and operation of which may be referred to for an understanding of the drive train of FIG. **5** as well. The crank assembly portion **144** is similar to the crank assembly **22** of FIGS. **1**-**4**B, the description and operation of which may be referred to for an understanding of the crank assembly portion **144** of FIG. **5** as well.

With continued reference to FIG. **5**, the frame assembly **120** includes one or more elongated drive members **56**, **58** and a driven member **60** respectively similar to the drive members **56**, **58** and driven member **60** of FIG. **2**, the respective descriptions of which may be referred to for an understanding of the drive members **56**, **58** and driven member **60** of FIG. **5** as well. One or more support blocks **146** support the ends **148** of the drive members **56**, **58**. The blocks **146** have a construction and shape suitable to maintain the drive members **56**, **58** at respective fixed positions with respect to the rest of the frame assembly **120** when the cover **138**, dispensing plate **132** and crankable drive train assembly **130** are uncoupled from the frame assembly **120**. Alternatively, other suitable components may replace the support blocks **146** so long as they maintain the drive members **56**, **58** at respective fixed positions with respect to the frame assembly **120**. The cover **138** is similar to the cover member **82** of FIG. **2**, the description of which may be referred to for an understanding of the cover **138** of FIG. **5** as well.

When the frame assembly **120**, dispensing plate **132**, crankable drive train assembly **130** and cover **138** are releasably coupled together, for example, via locking elements **150** and matching apertures **152**, a cavity **154** is defined that is suitable to hold a product container **32** such as a toothpaste tube. The operation of the product dispenser **118** is similar to the operation of the product dispenser **10** of FIGS. **1**-**4**B, the description of which may be referred to for an understanding of the operation of the product dispenser **118** of FIG. **5** as well. A difference between the respective operations of the product dispensers **10**, **118** lies in that the product dispenser **118** of FIG. **5** requires positional swapping of the dispensing plate **132** and crankable drive train assembly **130** with respect to the first and second ends **122**, **124** of the frame assembly **120** in order to get the dispenser **118** ready to receive a second product container **32***a*.

Accordingly, many further embodiments, applications and modifications of the invention will become readily apparent to those of ordinary skill in the art without departing from the scope of the invention that is intended to be bound only by the claims appended hereto.

What is claimed is:

1. A method for compelling a flowable product from a deformable product container, comprising the steps of:

inserting the product container into a frame assembly having first and second opposed frame assembly ends, first and second opposed dispensing notches respectively on the first and second frame assembly ends, at least one elongate drive member substantially extending between the first and second frame assembly ends and having first and second drive member ends, and first and second drive trains respectively operatively coupled to the first and second drive member ends;

positioning the product container within the frame assembly to expel the product through the first dispensing notch;

releasably operatively coupling a crank assembly to the second drive member end;

actuating the crank assembly to cause travel in a first direction from the second frame assembly end to the first frame assembly end of a driven member threadably engaged to the at least one drive member;

applying pressure on the container with the driven member to thereby compel the product from the container and through the first dispensing notch;

uncoupling the crank assembly from the second drive member end;

removing the container from the frame assembly;

inserting a second product container into the frame assembly to expel the product through the second dispensing notch;

releasably operatively coupling the crank assembly to the first drive member end; and

actuating the crank assembly to cause travel of the driven member in a second direction from the first frame assembly end to the second frame assembly end.

2. The method of claim **1**, wherein actuating the crank assembly comprises manual actuation of the crank assembly.

3. A product dispenser for dispensing a flowable product comprising:

a frame assembly having first and second opposed frame assembly ends;

first and second opposed dispensing notches respectively on said first and second frame assembly ends;

at least one elongate drive member substantially extending between said first and second frame assembly ends and having first and second drive member ends;

first and second drive trains each comprising a plurality of interconnected gears and each respectively operatively coupled to said first and second drive member ends;

a driven member threadably coupled to said at least one elongate drive member and adapted to travel between said first and second frame assembly ends; and

a crank assembly adapted to be selectively operatively coupled to one of said drive trains;

wherein:

actuation of said crank assembly causes travel of said driven member between said first and second frame assembly ends; and

actuation of said crank assembly causes the product to be expelled from the product dispenser when the product is positioned in said frame assembly and in communication with one of said dispensing notches.

4. The dispenser of claim **3** wherein actuation of said crank assembly further comprises moving said driven member in a direction away from said crank assembly.

5. The dispenser of claim **3**, further comprising opposed top and bottom walls defining a cavity in which the product is positioned, at least one of said top and bottom walls defining a window through which the product in said cavity is viewable.

6. The dispenser of claim **3** wherein said plurality of gears are serially connected.

7. The dispenser of claim **5** wherein one of said top and bottom walls is coupled to said crank assembly.

8. The dispenser of claim **5** wherein one of said top and bottom walls is integrally formed with said crank assembly.

9. The dispenser of claim **8** wherein said frame assembly is symmetric about a transverse plane.

10. The dispenser of claim **9** wherein said frame assembly is symmetric about a longitudinal plane.

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